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PROPHYLAXIS OF INFLUENZA IN THE USSR

[This is a summary of an article published by Prof V. D. Solov'-yev under the title "Prophylaxis of Influenza" in Vestnik Oto-Rino-Laringologii, Vol 16, No 4, pp 9-14, Jul-Aug 1954.]

To prevent influenza, it is necessary to isolate infected persons at an early stage. According to observations made by V. Ye. Martsinovskiy and S. A. Samvelova at three hostels where isolation had not been carried out in time, the number of persons infected comprised 97.6% there, while at hostels where medical service was properly organized, the number of influenza patients did not amount to more than 5.3%. The advisability of isolating as early as possible persons infected with influenza is also confirmed by data derived from other sources. In addition to the isolation of patients, the spread of influenza is prevented by the disinfection of the air in closed rooms.

An effective means of preventing complications in influenza and of treating this disease is administration of antibiotics. Ekmolin has been tried out on an extensive scale in the prophylaxis of influenza. According to the data obtained by many authors, intranasal administration of this antibiotic for the purpose of prophylaxis lowers the incidence of influenza by a factor of 1.5-3, while those who have been treated with the antibiotic but still acquire the infection recover within a somewhat shorter period of time. In the immunoprophylaxis of influenza, the use of anti-influenza serum is of importance. The serum is obtained by immunizing horses with the virus antigen. This serum, the use of which was proposed by A. A. Smorodintsev in 1938, is now supplied in the form of a powder in which the dried serum is combined with sulfadiazine, penicillin, and starch. The dry anti-influenza serum is administered intranasally (by blowing the powder into the nose). In view of the fact that this serum produces only a passive immunity, it exerts a prophylactic effect for a short period only. At the expiration of this period, renewed administration of the serum is required.

In research work aiming at the development of new methods for the prophylaxis of influenza, the greatest attention is being paid to active immunization against this disease. Among vaccines which contain virus that has been inactivated by killing it with weak solutions of formalin, allantois preparations of two types are most widely used. The first type of preparation is purified and concentrated by preliminary adsorption on erythrocytes and subsequent elution. The preparation of the second type is purified and concentrated by rapid supercentrifuging. In both cases the amniotic liquid of infected chicken embryos serves as the source of the virus.

Vaccines of this type were found to have a number of shortcomings, the chief of which is the difficulty of using them for prophylaxis on a mass scale because of the necessity of administering them by subcutaneous injection and because of the rapid weakening of the intensity of the immunity resulting from the innoculation. The reduction of intensity becomes noticeable as early as 2 months after the inoculation. The application of live allantois vaccines by the method of nose drops or the method of inhalation was found to be more effective.

The most efficient method of introducing the vaccine is intranasal administration. When the antigen is introduced to animals through the upper respiratory tract, the tissue of their lungs secretes antibodies with an intensity much greater than that observed after intraperitoneal introduction of the antigen. Investigations carried out by the author and by other scientists have shown that passing through animals the virus which has been isolated from human beings brings about profound changes in the biological characteristics

of this virus. The capacity of the virus to propagate in the organism of animals is weakened and other properties possessed by it are lost in the process.

At present two dry vaccines are produced for the prophylaxis of influenza by immunization, of which one is prepared according to the method proposed by A. A. Smorodntsev and O. I. Chalkina and the other according to a method proposed by V. M. Zhdanov and M. I. Sokolov. The latter vaccine contains only the dried allantois liquid of chicken embryos which have been infected with the virus of influenza. Before use, this vaccine is diluted with a physiological salt solution. It is applied in the liquid state either in the form of nose drops or by dispersing it with the aid of an atomizer.

During 1952-1953 epidemiological observations were carried out in Moscow on 141,256 persons to whom the dry live influenza vaccine had been administered. Notwithstanding the fact that during the period under consideration acute catarrhs of the upper respiratory tract comprised the most frequent type of disease encountered in Moscow, while cases of influenza amounted to no more than 1/3 of the total registered incidences of disease, the morbidity among people who had been immunized was nevertheless lowered by a factor of 1.6-2.7, according to statistics compiled by V. M. Zhdanov and I. I. Nikolayev. Prophylactic immunization against influenza was carried out on a larger scale in 1953 when dry live influenza vaccine was administered to approximately one million persons. Preliminary data which were available at the time of the writing of this article indicate that the immunization achieved by this means had been effective.

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